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Impact of Educational Interventions in Therapy Programs for People with Schizophrenia (PwS): A Systematic Review

Noor Cahaya[1], Susi Ari Kristina[2]*, Anna Wahyuni Widayanti[2] and James A Green[3]

1. Doctoral Program in Pharmacy, Faculty of Pharmacy, Universitas Gadjah Mada, Skip Utara 55281 Yogyakarta Indonesia
2. Laboratory of Pharmaceutical Management and Social Pharmacy, Faculty of Pharmacy, Universitas Gadjah Mada, Skip Utara 55281 Yogyakarta
3. School of Allied Health and Physical Activity for Health, Health Research Institute (HRI), University of Limerick, Limerick, Ireland

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*Corresponding author
Susi Ari Kristina

Email:
susiari_k@ugm.ac.id

ABSTRACT

Not only antipsychotics, but also additional interventions, such as education, are essential in the treatment of individuals with schizophrenia. This study aims to assess the impact of educational interventions within therapy programs for people with schizophrenia (PwS). Eligible studies were identified through searches in two electronic databases, PubMed and Science Direct, as well as a manual search. The search encompassed specific terms, namely ("people with schizophrenia" OR "patients with schizophrenia") AND ("education" OR "knowledge") AND ("medication adherence" OR "medication compliance" OR "medication persistence"). The Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) guidelines were employed for this systematic review. A team of three reviewers conducted article screening for inclusion and data extraction. The selected studies' quality was assessed using the Cochrane Collaboration's tool for assessing the risk of bias in randomized trials. Out of 666 studies, only seven met the criteria for a full review, spanning the period from 2012 to 2022. Educational interventions for patients can take the form of either a component within a therapy program or a comprehensive psychoeducational program that targets the patient, their family, or caregiver. These interventions are delivered by various healthcare professionals, including therapists, researchers, psychiatrists, and pharmacists. The duration of each intervention varies, ranging from three to eight sessions, with each session lasting approximately 45 to 120 minutes. Educational interventions yield inconsistent outcomes in terms of improving adherence, quality of life, stigma, and insight. However, they demonstrate positive outcomes in cognitive and social functioning as well as knowledge scores. Limitations that influence study outcomes encompass variations in patient characteristics, methodologies, and measurement instruments. In the future, clinicians can utilize these findings as a reference for tailoring educational interventions based on individual patient needs and characteristics within clinical settings.

Keywords: adherence, educational, interventions, knowledge, schizophrenia, systematic review

INTRODUCTION

Schizophrenia is a chronic mental disorder and a global mental health problem. According to Global Burden Disease reports, approximately 20 million people, or roughly 1% of the world's population, receive a diagnosis of schizophrenia (Collaborators, 2018). The clinical manifestation of schizophrenia is marked by brain disorders that lead to disorganized thinking, delusions, and hallucinations. Patients with schizophrenia also have communication problems, degraded reality, and poor cognitive function, which results in difficulties performing routine activities and a decline in social functioning (Farah, 2018; Kahn *et*

al., 2015). Schizophrenia can be a severe and chronic illness characterized by a lack of insight and low compliance with treatment (Xia *et al*., 2013).

The treatment of schizophrenia requires long-term intervention and medications to enhance psychological symptoms and prevent relapse. While numerous studies have demonstrated the effectiveness of antipsychotic medications in managing positive symptoms, the challenge remains in effectively ameliorating negative symptoms and cognitive impairment, both of which have been associated with impaired social functioning. Therefore, relying solely on medication is insufficient to promote rehabilitating people with schizophrenia. Many problems arise for people with schizophrenia following their discharge from the hospital, such as nonadherence to treatment, inconsistent medication intake, irregular consultations with physicians, self-discontinuation of medications without medical consent, and a lack of support from both family and the community (Xiao *et al*., 2015)

People with schizophrenia should acquire knowledge about their condition. Unfortunately, many patients lack the necessary knowledge and coping skills to adapt to this severe mental disorder (Huang *et al*., 2018). The treatment for people with schizophrenia should involve a combination of medication and psychoeducational interventions. Psychoeducation is essential for educating people with mental health knowledge and erasing misconceptions about mental illness. A study conducted by Dastan and Kilic (2014) emphasized the importance of providing information to schizophrenic patients during their post-hospitalization follow-up treatment. Therefore, it is necessary to educate patients adequately, offering them relevant clinical information to enhance their comprehension of their illness and its management during treatment. Furthermore, educating patients about the positive impacts of medications on psychiatric symptoms contributes to increased treatment adherence and better disease management. Several studies have demonstrated a correlation between psychoeducational interventions and improved medication adherence, quality of life, and various other outcomes among people with schizophrenia (Novick *et al*., 2015; von Maffei *et al*., 2015; Xia *et al*., 2013).

Therefore, this systematic review aimed to investigate educational interventions designed for PwS and their families and evaluate the impact of educational interventions in a therapy program for PwS. The results of this review can serve as a valuable reference for the development of educational interventions tailored to the specific characteristics of interventions implemented across various geographic regions explored in the studies included in this review.

MATERIALS AND METHODS

We conducted a comprehensive search for relevant studies in electronic databases, including PubMed and Science Direct, as well as in the Google search engine, to identify citations of relevant studies. Our search strategy incorporated the following keywords for screening: ("people with schizophrenia" OR "patients with schizophrenia") AND ("education" OR "knowledge") AND ("medication adherence" OR "medication compliance" OR "medication persistence"). To present the results of this systematic review, we followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page *et al*., 2021). Initial screening involved assessing articles' titles, index terms, and abstracts, followed by a full-text evaluation using predetermined inclusion criteria.

The search criteria encompassed articles focusing on patients formally diagnosed with schizophrenia, schizoaffective, or schizophreniform disorders, according to the criteria established in the Diagnostic and Statistical Manual, DSM-V-TR (APA, 2013) or the International Statistical Classification of Disease, Tenth Revision (ICD-10) These articles also focused on the utilization of oral antipsychotic medication as part of the treatment regimen. We limited our search to articles published in English between 2012 and 2022 and included only randomized trials or randomized controlled trials (RCTs) that evaluated the effectiveness of interventions aimed at enhancing knowledge related to the illness or therapy, medication adherence, or other outcomes linked to the impact of educational interventions for PwS. Exclusions encompassed editorials, letters to the editor, short communication, guidelines, conference abstracts, conference reports, protocol studies, systematic reviews, meta-analyses, and studies for which both the abstract and full text were unavailable.

Reference management was facilitated using Mendeley Software. The electronic search results were imported into Mendeley, and any duplicates were automatically identified and removed. Initial screening was conducted on titles, abstracts, and full texts, with the first screening phase being the

responsibility of one member of the research team, NC. Subsequently, the results underwent independent verification and validation by another research team member, SAK, to ensure the accuracy and completeness of the search process and to assess the studies' validity. Following the collection of full-text versions of relevant studies, data extraction was carried out by the research teams consisting of NC, SAK, and AWW. They also objectively evaluated the risk of bias in the studies included in this systematic review. We utilized a tool from the Cochrane Collaboration to assess the risk of bias in randomized trials. In disagreements among NC, SAK, and AWW, consensus was reached through discussion, and JG facilitated resolution when necessary.

RESULTS AND DISCUSSION

In the initial search, we identified 659 studies, with an additional seven studies included through citation tracking. After removing duplicate records (n=1), we conducted a screening process based on predefined eligibility criteria, reviewing titles and abstracts. This screening yielded 23 potentially relevant studies on the review topic. Out of these, 16 studies were excluded for specific reasons, which included the use of depot antipsychotics (n=7) and being in the form of protocols (n=9). Ultimately, seven studies met the inclusion criteria for this review. And the PRISMA flow diagram for the literature search process (Figure 1).

To assess the quality of the articles, we employed the Cochrane Risk of Bias Tool, version 1.0, consisting of seven domains. The risk of bias for each domain was evaluated using established criteria, categorized as low (indicating low risk of bias across all domains), unclear (indicating uncertain risk of bias in one or more domains), or high (indicating high risk of bias in one or more domains) (Higgins *et al*., 2011) (Figure 2).

This review encompassed seven studies that employed a randomized controlled trial (RCT) design. The eligible publications were published within the timeframe of 2012 to 2022 and were conducted in diverse geographical locations, including Japan, Germany, India, Jordan, China, and Vietnam. The majority of these studies featured outpatients as their primary participants. These participants were individuals diagnosed with schizophrenia or schizoaffective disorder according to operationalized criteria, such as DSM or ICD. The age range of the patients involved in these studies varied from 18 to 65. The sample sizes of the included studies ranged from 23 participants (Mishra *et al*., 2017) to 327 participants (Li *et al*., 2018) (Table I).

Description of educational interventions

Seven studies incorporated educational intervention-based programs as a fundamental component of their research objectives (Table II). The first study, conducted by Chien and Thompson (2014), introduced a Mindfulness-based psychoeducation program (MBPP). This program seamlessly integrated mindfulness-based techniques with psychoeducation to foster overall well-being and encourage healthy behaviors. The MBPP was aimed to facilitate the development of mindfulness skills among PwS, fostering self-awareness, reducing stress, and enhancing overall mental well-being.

In the second study, Hasan *et al*. (2015) conducted a psychoeducational intervention. This intervention involved providing a booklet every two weeks for 12 weeks to people with schizophrenia and their caregivers. The content of the booklet included general information about schizophrenia, symptoms, medication management, problem-solving strategies, and communication skills for people with schizophrenia and their caregivers. The primary objectives of this psychoeducational intervention were to reduce relapse rates, improve the quality of life of people with schizophrenia, and alleviate the burden on caregivers. In addition, it aimed to provide knowledge about schizophrenia disease, medication management, and communication skills for both patients and caregivers.

In the third study, conducted by Ngoc *et al*. (2016), the Family Schizophrenia Psychoeducation Program (FSPP) was implemented. This psychoeducation program was designed for individual patients and their families in Vietnam to reduce stigma, enhance medication adherence, and improve the overall quality of life. The program delivered comprehensive information to families about schizophrenia, instilled realistic expectations regarding the capabilities of people with schizophrenia, and imparted skills to support family members in achieving as normal a life as possible. Additionally, it targeted the reduction of stigma associated with schizophrenia.

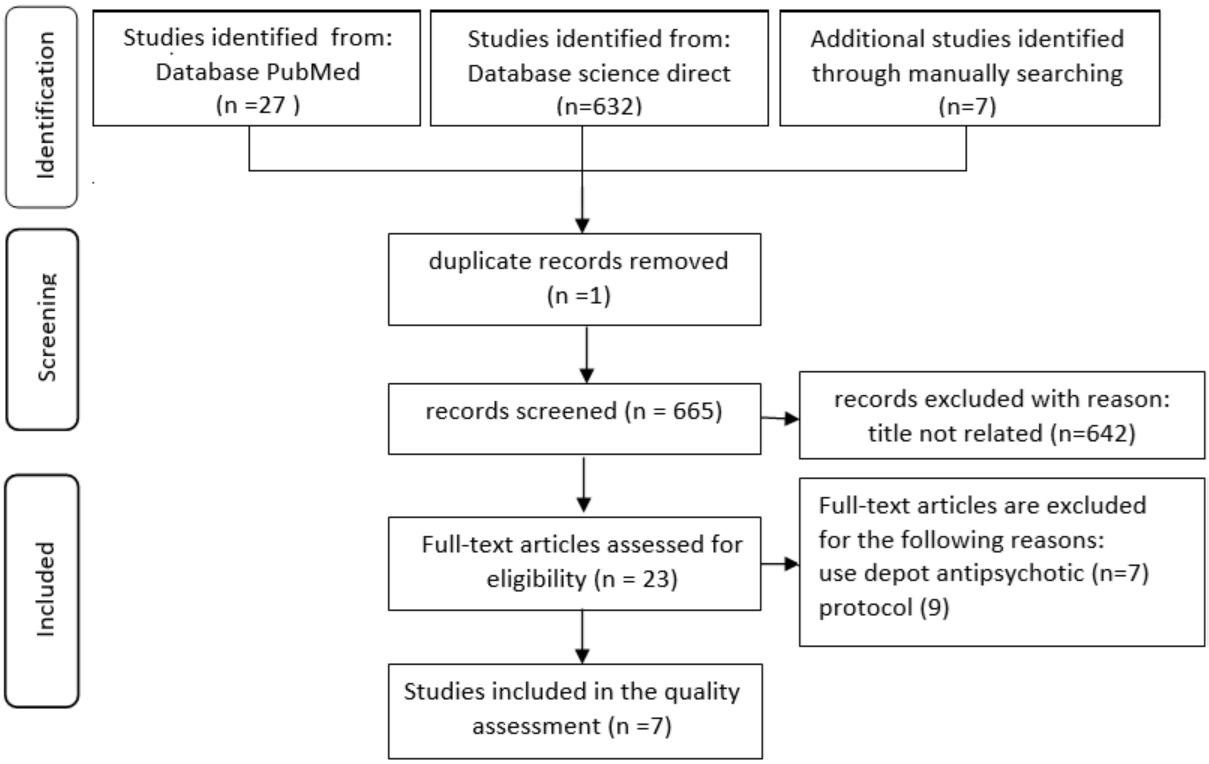

Figure 1. PRISMA screening diagram of retrieved studies

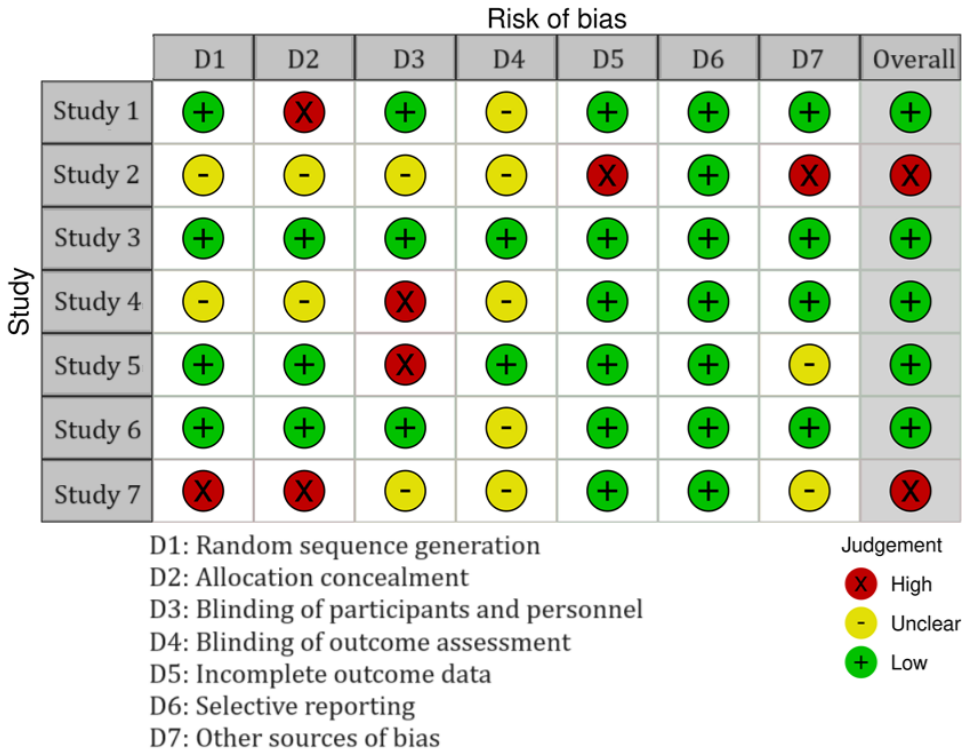

Figure 2. Quality assessment of studies

Table I. Summary characteristics of included studies

Study no.	Study author(s) and year published	Country	Sample (N)	Study design	Inclusion criteria	Setting
1	Shimada *et al*., 2018	Japan	129	RCT	Patients with a diagnosis of schizophrenia or schizoaffective disorder 20-65 years	Inpatients in psychiatric hospitals
2	Bäuml *et al*., 2016	German	41	RCT	Patients with a schizophrenic or schizoaffective psychosis; an indication of antipsychotic relapse prevention for a period of at least 12 months; age between 18-65 years	Outpatients in study centers
3	Mishra *et al*., 2017	India	23	RCT	aged ≥18 years, treated for schizophrenia, and literate	Outpatient and has been under treatment for at least six months in the Psychiatry Department
4	Li *et al*., 2018b	China	327	RCT	Patients with a diagnosis of schizophrenia, aged between 18 and 50 years Years; finished primary school education; took antipsychotic medications with clinical stability; lived in the local community during the study	Participants in the community who have been registered in the system of database for the management of severe mental disorders
5	Hasan *et al*., 2015	Jordan	121	RCT	Adult patients aged 18 years; diagnosed with schizophrenia or schizoaffective disorder; able to read and write English or Arabic, and willing and able to participate in research.	Outpatient mental health clinics
6	Chien & Thompson, 2014	China	107	RCT	Patients with a diagnosis of schizophrenia according to the DSM-IV criteria; 10 (b) had a history of <5 years of illness at recruitment; (c) were 18 years or older, and (d) were able to understand Chinese/Mandarin	Outpatient clinics
7	Ngoc *et al*., 2016	Vietnam	59	RCT	Patients with a diagnosis of schizophrenia with no more than three prior psychiatric hospitalizations including the current one, less than three years for their schizophrenia; age between 18 and 30 years; and family living within 50 kilometers of the hospital	Study participants were recruited from the Danang Psychiatric Hospital, the primary mental health facility in central Viet Nam and the third-largest psychiatric hospital in the country,

Table II. Summary of the studies reviewed.

Author (Year)	Program or intervention	Personnel who delivered	Target of interventions	Duration and number of sessions
Chien & Thompson, (2014)	Mindfulness-based psychoeducation program (MBPP)	Trained therapists	Outpatients	Participants received 12 fortnightly, 2h sessions of the program over 24 weeks.
Hasan *et al.*, (2015)	Psychoeducation	Researcher	Patients and their family	The intervention group received treatment support psychoeducational booklets each fortnight for 12 weeks.
Ngoc *et al.*, (2016)	The Family Schizophrenia Psychoeducation Program (FSPP)	Psychiatrist in hospital	Patients and their family	The program consists of three sessions of approximately 1.5 h over a week and a half.
Bauml *et al.*, (2016)	Psychoeducation	Trained therapist	Patients and their relatives	there are a total of 8 sessions, four weekly sessions of 60 minutes each; after that, four additional monthly sessions Moreover, relatives are invited to the eight weekly sessions, each for 90 min.
Mishra *et al.*, (2017)	Pharmacist-led collaborative patient education	Pharmacist	Outpatients	Not mentioned
Li *et al.*, (2018)	Community-based comprehensive intervention .	Experienced psychiatrist, a psychotherapist, and a social worker.	People with schizophrenia living in the community	The intervention was delivered thrice: monthly in the first six months and twice in the last three months. Twenty-four modules were included in the intervention and completed in eight phases, and every phase consisted of three modules. Three modules were given during every phase for 120 min.
Shimada *et al.*, (2018)	Individualized occupational therapy (IOT)	Therapist	Acute schizophrenia in hospitals	It is not explicitly mentioned how long psychoeducation is given to patients. However, it is mentioned that the IOT program, including individual psychoeducation, is given 1-2 times a week for 45-60 min each session.

In the fourth study conducted by Bauml *et al*. (2016), a psychoeducation program was administered to PwS and their families. This program incorporated modules and informational booklets containing details about the disease and its treatment, facilitating the patient learning process. The program encompassed an initial introduction to the disease and its treatment, guidance on managing symptoms and coping with stress, and providing communication skills and problem-solving strategies.

In the fifth study conducted by Mishra *et al*. (2017), the intervention titled 'Pharmacist-led collaborative patient education' was implemented. This intervention involved pharmacists delivering specially designed patient information leaflets (PILs) to educate patients. In the sixth study, conducted by Li *et al*. (2018), a community-based comprehensive intervention was administered. This comprehensive intervention package comprised four distinct components, namely Self-Awareness and Self-Disclosure (SASD), psychoeducation, Social Skills Training (SST), and Cognitive Behavioral Therapy (CBT).

The seventh study, carried out by Shimada *et al*. (2018), focused on an Individualized Occupational Therapy (IOT) program. IOT is a psychosocial treatment program personalized to meet the unique needs of individual patients with acute schizophrenia. This program includes elements such as motivational interviews, self-monitoring, individual visits, handicraft skills, psychoeducation, and discharge planning. This program aims to encourage active engagement in treatment, enhance cognitive and social functioning among patients, improve medication adherence, and boost intrinsic motivation.

Personnel who delivered

The interventions were administered by trained therapists who had undergone specialized training in delivering psychoeducational interventions (Bäuml *et al*., 2016; Chien & Thompson, 2014). In the study conducted by Shimada *et al*. (2018), licensed occupational therapists were actively involved in the intervention process. Some studies featured a multidisciplinary team of professionals, comprising an experienced psychiatrist, psychotherapist, and social worker. Conversely, certain studies exclusively engaged psychiatrists (Ngoc *et al*., 2016), while one study enlisted pharmacists in delivering interventions to participants (Mishra *et al*., 2017). In addition to healthcare professionals, some studies involved researchers themselves as personnel directly providing interventions to participants (Hasan *et al*., 2015).

Target of interventions

Several interventions in these studies were specifically targeted at either inpatient or outpatient settings. Furthermore, some programs were designed to benefit not only patients but also their families or caregivers.

Two studies focused on outpatients, specifically individuals with schizophrenia receiving outpatient services at three clinics in Singapore (Chien & Thompson, 2014) and those undergoing treatment for a minimum of six months at the Department of Psychiatry, JSS Medical College & Hospital, Mysore, India (Mishra *et al*., 2017). Another study extended its intervention to people with schizophrenia residing in the community of Guangzhou, China (Li *et al*., 2018), while one study exclusively targeted patients with hospital admissions (Shimada *et al*., 2018). Some studies encompassed patients in both clinic and hospital settings, delivering interventions to both patients and their families, relatives, or caregivers (Bäuml *et al*., 2016; Hasan *et al*., 2015; Ngoc *et al*., 2016).

Psychoeducational interventions can also be extended to the families or caregivers of individuals with schizophrenia, providing significant benefits to the families by enhancing their understanding of antipsychotic medications. This, in turn, enables them to effectively supervise and support their relatives who are undergoing treatment for schizophrenia. Additionally, family members receive information about schizophrenia, learning how to accept, treat, and offer support to their loved ones as they strive to recover and reintegrate into daily life (Bäuml *et al*., 2016; Hasan *et al*., 2015; Mishra *et al*., 2017; Ngoc *et al*., 2016). According to a systematic review, psychoeducation consistently contributes to increased knowledge and coping abilities among family members. However, it has shown less effectiveness in alleviating family members' psychological distress, burden, or emotional expression. The review also recommends that psychoeducation should be provided to family members as early as possible after they come into contact with health services (Sin & Norman, 2013).

Duration and Number of Sessions

In one study (Mishra *et al*., 2017), the duration and number of sessions were not explicitly mentioned. However, the other studies

employed varying frequencies and durations for their interventions. These included: 1-2 sessions per week lasting 45-60 minutes each (Shimada *et al*., 2018); four weekly sessions of 60 minutes each, followed by four additional monthly sessions for patients, and 8 weekly sessions lasting 90 minutes each for relatives (Bäuml *et al*., 2016); three sessions of approximately 1.5 hours each over a week and a half (Ngoc *et al*., 2016); 12 sessions held fortnightly for 2 hours each (Chien & Thompson, 2014); and sessions conducted every fortnight for 12 weeks (Hasan *et al*., 2015b). Additionally, the intervention in another study comprised 24 modules completed in eight phases, with each phase involving three modules administered over 120 minutes (Li *et al*., 2018).

Effect of intervention on medication adherence or compliance

Three of the five conducted studies demonstrated a statistically significant improvement in medication adherence compared to the control group. However, the findings outlined in this study also underscore the lack of consistency in the impact of educational interventions on medication adherence outcomes among people living with schizophrenia. Four of the seven studies included in this review assessed patient medication adherence. They employed various rating scales to evaluate adherence, including the Morisky Medication Adherence Scale (MMAS-8), Medication Adherence Rating Scale (MARS), the Dunja Medication Compliance Inventory assessment, and medication adherence, as rated by a senior psychiatrist on a scale from one to three (Li *et al*., 2018).

The medication compliance inventory is based on an assessment similar to Dunja *et al*. (2007) but adapted for Vietnamese patients. The rating scale comprises eight items, each assessed on a frequency scale ranging from 0 to 2, with higher scores indicating increased non-compliance. The results revealed significant treatment effects on compliance in patients with schizophrenia (Ngoc *et al*., 2016).

The assessment of adherence was conducted using the Morisky Medication Adherence Scale-8 (MMAS-8) instrument in the study by Shimada *et al*. (2018). The results yielded significantly different adherence scores between the intervention and control groups ($p < 0.01$). Additionally, in the research by Mishra *et al*. (2017), the Medication Adherence Rating Scale (MARS) instrument demonstrated a statistically significant overall mean improvement in medication adherence (from the first follow-up to the third follow-up) between the intervention group and the control group. In another study, medication adherence was assessed by a senior psychiatrist, who assigned grades as follows: 1 (complete medication adherence), 2 (partial medication adherence), and 3 (very poor medication adherence). Furthermore, the proportion of each group was calculated to evaluate medication adherence among patients with schizophrenia. The results indicated that there was no significant difference in adherence between the intervention group and the control group ($p > 0.05$) (Li *et al*., 2018).

In the study conducted by Bauml *et al*. (2016), compliance was assessed by quantifying the mean quantity of consumed CPZ (Chlorpromazine) units. This data was assessed at two points in time, specifically two years and seven years following the first discharge. Compliance was evaluated by the treating psychiatrists using a 4-point ordinal scale, with ratings ranging from 1 (very good) to 4 (poor). Upon hospital discharge and again at the seven-year mark, both groups exhibited high levels of compliance, which were categorized as 'good' or 'very good.' Notably, no statistically significant difference was observed between the intervention and control groups.

Effect of intervention on cognitive functioning & social functioning

In the study conducted by Shimada *et al*. (2018), the assessment encompassed cognitive and social functions. To evaluate cognitive functioning, the study employed the Brief Assessment of Cognition in Schizophrenia Japanese version (BACS-J) and the Schizophrenia Cognition Rating Scale Japanese version (SCoRS-J). The BACS-J is a comprehensive neuropsychological assessment tool designed to assess various cognitive domains, including verbal memory, working memory, motor speed, fluency, attention, and executive function. On the other hand, the SCoRS-J is a standardized tool consisting of 20 items to evaluate self-reported cognitive impairments and their impact on individuals' daily activities. The study also utilized the Global Assessment of Functioning (GAF) and the Social Functioning Scale Japanese version (SFS-J) to evaluate social functioning outcomes. The GAF assesses an individual's social, occupational, and psychological functioning, while the SFS-J evaluates social functioning across multiple domains, such as social engagement, communication, and independence. The overall assessments revealed a

significant improvement in both cognitive and social functions.

The study conducted by Li *et al*. (2018) also involved the measurement of the Global Assessment of Functioning (GAF). The results demonstrated an increase in the total GAF score in the intervention group compared to the control group. In the study conducted by Chien and Thompson (2014), the assessment of psychosocial functioning in patients with schizophrenia was carried out using the Specific Levels of Functioning Scale (SLOF). The SLOF is an instrument employed to evaluate the psychosocial functioning of individuals diagnosed with schizophrenia across three distinct domains: self-maintenance, social functioning, and community living skills. The study's findings indicated that the group receiving the Mindfulness-Based Psychosocial Program (MBPP) intervention demonstrated a statistically significant increase in SLOF scores compared to the group that received the conventional psychoeducational program.

Effect of intervention on symptoms

Three studies have assessed changes in symptoms among individuals diagnosed with schizophrenia using the PANSS scale as their evaluation instrument. The Positive and Negative Syndrome Scale (PANSS) is a validated and widely used clinical assessment instrument. It employs a standardized interview format to assess the severity and presentation of positive and negative symptoms, as well as general psychopathology in individuals diagnosed with schizophrenia, focusing on the preceding week.

In a study carried out by Shimada *et al*. (2018), it was observed that the IOT (Individualized Occupational Therapy) intervention resulted in a significant improvement in symptoms based on the PANSS scale. The intervention group exhibited a lower mean total score on the PANSS scale, indicating enhancements in the positive, negative, and general psychopathology subscales compared to the control group.

In the study conducted by Li *et al*. (2018), the Chinese version of the PANSS negative scale was employed. Notably, at both the 6-month and 9-month time points, a statistically significant reduction in the PANSS-N total score was evident in the intervention group compared to the control group.

In the study conducted by Hasan *et al*. (2015), similar findings were demonstrated, with a decrease in symptom severity observed during the 3-month follow-up period after the intervention.

Effect of intervention on knowledge

Only one study has assessed the increase in knowledge among patients with schizophrenia following the intervention. Patients with schizophrenia in the intervention group experienced more significant improvement in knowledge scores (4.9 vs -0.5; $p<0.001$) at the post-treatment assessment and (6.5 vs -0.7; $p < 0.001$) during the three-month follow-up period. The enhancement in knowledge about schizophrenia was quantified using the Knowledge About Schizophrenia Questionnaire (KASQ) (Hasan *et al*., 2015).

Effect of intervention on quality of life

The results of the study conducted by Mishra *et al*. (2017) showed an increase in quality of life across all domains, as assessed through the WHOQOL-BREF instrument, in the intervention group. The increase in quality of life in the intervention group was more significant than in the control group during each follow-up assessment, and these differences were statistically significant.

In contrast to the quality of life measurements conducted in other studies, the study by Hasan *et al*. (2015) opted not to assess the quality of life of people with schizophrenia. Instead, they focused on measuring the quality of life of relatives or caregivers responsible for individuals with schizophrenia. The Quality of Life was measured using the Schizophrenic Carers' Quality of Life Scale (S-CQoL), which consists of seven assessment domains. The results of this measurement indicated a significant improvement in the quality of life of primary caregivers.

In the study conducted by Ngoc *et al*. (2016), the quality of life assessment was carried out using the Quality of Life Enjoyment and Satisfaction Questionnaire. The findings of the study indicated a significant treatment effect on the quality of life of the patients in the intervention group.

Effect of intervention on stigma and insight

One of the parameters assessed in these studies is stigma, which was assessed for both patients and their families. A study conducted by Ngoc *et al*. (2016) found that the FSPP intervention significantly reduced stigma in both patients and their families.

In the study conducted by Li *et al*. (2018), the Internalized Stigma of Mental Illness (ISMI) scale,

specifically its Chinese version, was employed to assess stigma. The measurement was administered by a questionnaire consisting of 29 items that assessed self-stigma in individuals diagnosed with schizophrenia. The findings indicated that, following a 9-month intervention period, there was no statistically significant decrease in ISMI total scores within the intervention group compared to the control group.

Each study in this review uses a different educational intervention for people with schizophrenia. As a result, the findings across these studies exhibit various effects. Educational interventions designed for individuals with schizophrenia have demonstrated the capacity to enhance the understanding of the condition and its treatment, not only among the affected individuals but also among their families. Additionally, these interventions have shown promise in reducing stigma, enhancing insight into the illness and its treatment, improving cognitive function, mitigating the severity of schizophrenia symptoms, and elevating the quality of life for both patients and their families(Chien & Thompson, 2014; Hasan *et al*., 2015; Li *et al*., 2018; Mishra *et al*., 2017; Ngoc *et al*., 2016).

Psychoeducational interventions can also be extended to the families of individuals with schizophrenia who provide caregiving, and they have demonstrated benefits for these families. These interventions serve to enhance the families' understanding of antipsychotic medications, enabling them to better oversee their relatives undergoing treatment for schizophrenia. Furthermore, these interventions offer essential insights to the patient's family members, guiding them on how to accept, support, and care for individuals with schizophrenia as they work towards recovery and reintegration into everyday life (Bäuml *et al*., 2016; Hasan *et al*., 2015; Mishra *et al*., 2017; Ngoc *et al*., 2016). However, according to a systematic review, while psychoeducation consistently proves effective in increasing family members' knowledge and enhancing their coping abilities, it tends to have a limited impact on changing family members' psychological well-being, burden, or emotional expression. This review highlights the importance of providing psychoeducation to family members as early as possible, ideally following their initial contact with health services (Sin & Norman, 2013).

Psychoeducational care is a flexible intervention that a range of mental health professionals can administer to individuals diagnosed with schizophrenia. A study that involved pharmacists in educating and counseling patients with schizophrenia underscored the therapeutic communication skills possessed by pharmacists that can be effectively applied in the realm of psychiatric pharmaceutical services, particularly for individuals with schizophrenia (Mishra *et al*., 2017). In addition, a systematic review emphasized the preference for psychoeducational interventions when addressing individuals with schizophrenia over other forms of psychosocial interventions, such as social skills training and cognitive therapy. This preference is attributed to the adaptability of psychoeducational interventions, which can be implemented in various psychiatric clinical settings, including community, inpatient, and outpatient contexts (Alhadidi *et al*., 2020).

Educational interventions hold significant implications for various stakeholders, including patients, families, healthcare professionals, and pharmacists. These interventions serve to enhance the understanding of schizophrenia's nature, symptoms, and development. They increase patient awareness of their condition and actively engage families in the treatment process, offering support and insights into how to effectively assist the patient. In the future, pharmacists should expand their involvement and collaboration with the healthcare team, which may include physicians, psychologists, and social workers. This collaboration should encompass discussions about patient progress and potential problems related to medication usage and treatment adherence.

Strengths and limitations

Our literature search encompassed two databases and incorporated a manual search for relevant studies. Consequently, it could include most of the relevant studies in the field. Furthermore, we conducted independent reviews of the full-text articles to mitigate selection bias. In assessing the risk of bias, we employed standardized assessment tools, and these assessments were also conducted independently.

Our study is subject to several limitations. Firstly, our inclusion criteria were restricted to studies published in English. As a result, potentially relevant studies in other languages were not included in our review due to language constraints. Secondly, we exclusively considered studies with a randomized controlled trial (RCT) design, thus excluding other study designs, such as quasi-experimental or non-randomized studies. It is

crucial to acknowledge that various limitations, including variations in patient characteristics, methodological approaches, and outcome measurement methods, may influence study outcomes.

CONCLUSION

Educational interventions can be administered to patients or their families with the support of healthcare professionals through various methods, as evidenced in each study. However, based on measurements of various outcome variables, the results have displayed inconsistency in terms of improving adherence, quality of life, reducing stigma, and enhancing insight for individuals with schizophrenia or their caregivers. Conversely, the impact on enhancing cognitive and social functioning and knowledge scores has shown positive results. In the future, clinicians can use these results as a valuable reference when tailoring educational interventions to align with patients' specific needs and characteristics within clinical settings.

CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest concerning this article's research, authorship, and publication.

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